On "commons" and New Institutional Economics: A "precursor" revisited - Jens Warming (1873-1939)

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Abstract
In his seminal paper, Gordon (1954) argued that, in a situation of open access and competition, the market would not lead to the most efficient solution in resource use. Almost four decades earlier, in 1911, a Danish economist, Jens Warming, put this issue and made a very similar analysis for the fisheries sector.

The purpose of this research is to make a reflection on that paper and highlight the proposed explanation for the common property problem. This paper studies the legacy of this interesting fisheries economist to the history of economic thought and put in evidence its role as a "precursor" in important topics of investigation of the New Institutional Economics. This research also ask what went wrong and why did the important achievements of Warming's research had not the justified academic applause and practical impact.

Keywords: Jens Warming, fisheries, open access, regulation

JEL Classification:Q22, B00

1. Introduction

From the Ronald Coase Institute site:

> New Institutional Economics incorporates a theory of institutions –laws, rules, customs, and norms– into economics. It builds on, modifies, and extends neoclassical theory. It retains and builds on the fundamental assumption of scarcity and hence competition –the basis of the choice theoretic underlies microeconomics. It has developed as a movement within the social sciences that unites theoretical and empirical research examining the role of institutions in furthering or preventing economic growth. It includes work in transaction costs, political economy, property rights, hierarchy and organization, and public choice. It involves work in political science, law, sociology, anthropology, and other social sciences.

NIE can be seen as a new variant, from the later 20th century, of the so-called Institutional Economics developed in the first part of the century and including important names as Thorstein Veblen, Wesley Mitchell and John Commons.[1]

The author that we are analyzing here could not integrate this school because of a simple reason, his age. Jens Warming lived and researched in the early 20th century. In a certain sense, he can be seen as a contemporary –perhaps more as a "precursor"– of some of the most important names of the "old" Institutional Economics School. In his work there are not special references to these authors –Veblen, Mitchell or Commons–but there are significant references to authors of the German school, which are usually referred as important references and influence on the first Institutional Economics. So, why introduce here such an investigator?

The reason is that in 1954, Scott Gordon published a paper in the Journal of Political Economy that went on being a mark in the History of Economic Thought. In his seminal paper "The

[1] See Veblen (1899), Mitchell (1910), Commons (1931) and Hodgson (1998).

Economic Theory of a Common Property Resource: The Fishery", Gordon argued that, in a situation of open access and competition, the market would not lead to the most efficient solution in resource use. The common property nature of fish resources implied that, in an unregulated fishery, the result would be the expansion of the industry to a point of economic, even biological, overfishing. So, there is nothing like an "invisible hand" and it is the common property nature of the resources and the presence of externalities in the process of capture that are the root causes of the mismanagement of the resources and the so-called "Tragedy of the Commons" (Hardin, 1968). The origins of modern Fisheries Economics can be traced back in the 50's with that paper of Gordon (1954), and also with the papers of Scott (1955) and Schaefer (1957). Perhaps more important: this paper is today seen as a perfect classic for Natural Resource and Environmental Economics. And, perhaps more important for this investigation, after this paper, several investigations on property rights and "tragedies" in natural resource use; "commons" conceptualization and public regulation; externalities and public goods; institutions, models of governance and development, were developed. In almost all of those reflections we encountered for the most important names of NIE: from Alchian, Demsetz, Cheung or De Alessi, to Bromley, Coase, Williamson, North or Ostrom,[2] everyone was touched by the singularity and profundity of this paper and, in different ways and directions, went on developing the fundamental legacy of Gordon's ideas, the four last names even becoming recognized Nobel prize in Economics.

But in fact, there is another, more antique, article that put the problem and suggested a similar approach to its understanding. In a simple paper, in 1911, a Danish economist, Jens Warming, precisely, put this issue and made a very similar analysis for the fisheries sector. The purpose of this research is to make a reflection on that paper and highlight the proposed explanation for the common property problem. The paper studies the legacy of this interesting fisheries economist to the history of political economy and ask what went wrong and why did the important achievements of Warming's research had not the justified academic applause and practical impact. His proximity –and differences– with "old" and New Institutional Economics is highlighted.

2. Jens Warming (1873-1939): biographic notes

Jens Warming's family belonged to the intellectual elite of Denmark. His father, Eugenius Warming, was an important and influential professor of Botany in the University of Copenhagen and his contributions on ecology were internationally recognized.

Jens Warming was graduated in Law, in 1897, in the University of Copenhagen, and went to Nebraska/USA where he worked, teaching for three years, in a Danish school. After his return to Denmark, he made a special master degree in Economics, usually given to lawyers who wanted to develop a career in the administration. So, Warming went on pursuing a remarkable career in the Danish Central Department of Statistics (1904-1919).

He was not a "genuine economist" (Topp, 2008) but he also went on being a part-time professor of Economics and Descriptive Statistics in the Danish Agricultural University and in the University of Copenhagen. This lack of formal graduation in Economics gave him some problems. He was frequently criticized for insufficient knowledge of economic theory and, when he finally got a permanent tenure in the University, it was in Statistics, never getting the desired chair of Economics. Even his mentor, H. Westergaard, leader professor in Economics in the University of Copenhagen, seemed not to understand the relevance of his work. Jens Warming tried to get the tenure in Economics for two times but, in the first time, it was L. Birch –another later well-known Danish economist– to be chosen and, in the second, it was his previous student, A. Nielsen, who got the professorship in Economics.

Some personal animosity played an important role. But it was, perhaps, his proactive attitude towards government regulation and intervention at the microeconomic level –that was not in

[2] See, for example: Alchian (1965), Alchian & Demsetz (1973), Demsetz (1967), Bromley (1985, 1991), Cheung (1968), Coase (1960), Williamson (2000), North (1990), Ostrom (1990).

accordance with the mainstream view, in the 20's, that the deregulation was required– that gave him some bitter objections in the academic playground (see Eggert, 2010, and Topp, 2008).

His fundamental work rested in the Descriptive Statistics. In 1929, Warming published a textbook on Danish statistics, with an applied economic perspective. For more than a decade, his book of Denmark characterization was extensively used by Danish students in Economics. Teaching economic theory was not, naturally, his task, but in his statistics textbooks he went on making several critiques on mainstream economics and including his theoretical contributions. He also tried, from 1921, to write a textbook in Economics but it was never published because of the dispute between a professor of Statistics and the professor of Economics in the Copenhagen University.

After the flaw of getting the desired tenure in Denmark he went on trying to get applause externally. In 1926, he submitted an essay to an international competition on the theory of wages. He did not win the competition but he had an "honorable mention" and the recognition from foreign colleagues that made him to pursuit his efforts in the economic area, finally publishing a paper in the *Economic Journal*. After all, his ability in recognizing and applying the conceptualization of marginal revolution was evident and his developments in the area of wages and rents rested upon the most recent developments in Economics. In the paper he published in the *Economic Journal*, Warming made an interesting presentation of the multiplier (see Topp, 1981) on the link between Keynes theory and Warming's research. He also made important seminal references about the problem of identification in econometric analysis.

Besides his knowledge about the economic science, his work has only a few references. Wicksell and Marshall are the most cited, but also Fisher and Germanic authors, especially about the quantitative theory of money. This parsimony use of bibliographical references is also very far from what is the academic "political correct" attitude.

3. *On rents of fishing grounds* revisited: open access and regulation

Warming's legacy in Economics counts for several achievements. Our approach highlights his contribution in the fisheries area and the way he treats the problem of common property. That is, perhaps, the most innovative in his research and the one that percusses some important discussions of recognised authors of Institutional Economics.

Forty three years before the publication of Gordon's seminal paper, Jens Warming made an important investigation about the problems of open access in the allocation of a common-property resource and presented his results in a short article (1911) "Om Grundrente af Fiskegrunde" ("On Land-rent of Fishing Grounds") published in the *Journal of the Danish Economic Association.*[3]

In the paper, Warming compared the rent available from fishing grounds and land. Land is, in the most part, in private hands and land rents are a privilege of private landowners, whereas fishing grounds are not privately owned but are considered common property. However, the differences do not change the basic economics of both forms of management. Warming stated that the common property nature of open access to fishing grounds without charges tends to decrease the rent and he proposed to alleviate this through transferable fishing licences.

The core idea of the paper reflected the Marginal Revolution. In a competitive economy, a worker earns a wage equal to the value of his marginal product. But, according to Warming, there were examples in the economy where this did not hold. One of these exceptions was the case of the fisheries where the problems occurred due to a "lack in the organization of society". These exceptions did not question the theory of marginal productivity as a general fundament but, some of them, had practical relevance. Warming explained that, under open access, the potential rent in a fishery is dissipated. As no one has property rights over the resource and there

[3]After this article, he made several references of his results in two unpublished books: a textbook from 1921, previously referred, and another 1926 manuscript. This last manuscript, which was intended for an international audience, included an English new version of his 1911 model and became the main ingredient of a second article on fisheries, in 1931.

is no possibility of exclusion, the permanent introduction of a newcomer in the fishery must not cess until the difference between revenues and costs are zero, that is, until all the rents are dissipated. Biological regulation, as closed seasons or mesh size specification, can prevent the biological overexploitation of resources but not the economic overexploitation. He also pointed out that a tax, equal to the difference between average and marginal revenue, at the optimal level, would lead to an optimal fishery. This idea is also very interesting, clearly reminding the proposals of pigouvian taxes to internalise the external effects. Note that it was only in the subsequent decade of the 20's, that those ideas were mostly divulgated by Pigou.

In his 1911article, Warming did not elaborate much regarding the practical implications of his proposals but 20 years later he published another article ,"*The Danish Right to Eel Weir"*,1931, going into new details and presenting a graphical presentation to explain his findings (Warming, 1931).

Figure 1. Graphical presentation of Warming's Model

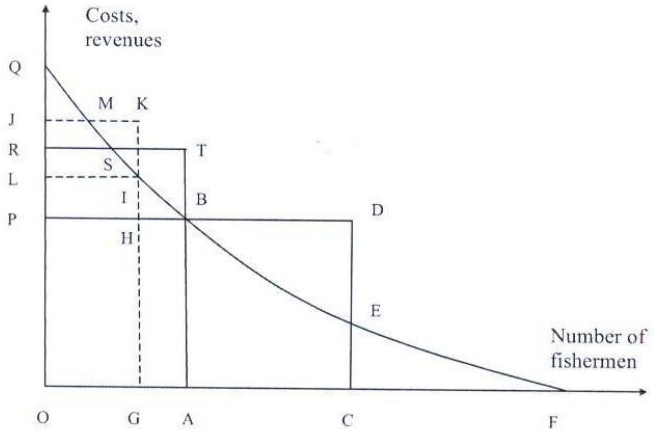

Figure 1 The correct number of fishermen (OA) with a single owner of the rights to a fishing ground, compared to the number (OC) with no owner at all (full freedom)

Source: Gislason, G. (1995), "Fisheries management in Iceland and J. Warming's contribution to the Economics of the Fisheries", *Finnish Economic Papers*, 8 (1), 57

The returns from fisheries are shown in the vertical axis, whereas in the horizontal axis we have the fishing effort measured by the number of fishermen.

The curve QF shows the diminishing returns as the fishing effort increases. The line PD represents the marginal cost.

In this context, total benefits are maximized when the number of fishermen is OA, and the total income of fishermen is the area OABP.

Warming compares fishing with farming and states that the number of workers hired by a profit maximizing farmer will be such that the last worker hired produces as much as he receives in wages.

The total income from fishing is, in fact, OABQ. So, the value PBQ is the sea rent for access to the resource on the fishing grounds. If no one collects this sea rent and fishing is free, the average income of OA fishermen will be higher than AB and, as this rent is divided among fishermen, their mean income rests AT, that is, the median height of OABQ, so the value RSQ is equal to the value STB.

High average profit draws more people into fishing. Equilibrium is achieved where fishing effort is OC and total income is equal to the total cost of fishing, PBQ=BED. The additional fishermen produce only ACEB and could produce more in some other pursuit. They only receive the required ordinary income by having PBQ added to their production. The sea rent is wasted in the sense that it subsidizes the income of extra fishermen whose production does not correspond to their wages.

Finally, he maintains that in order to prevent that the number of fishermen goes up to OA, fees should be collected for the licences. A private owner would collect such fees and the fee ought to be BT, to result in the optimal number of people in the fishing activity. This would provide PBTR in the form of fees, received by the "land" owner or by the Government.

In this 1931 paper, Warming introduces some additional features:

- A right for the coastal owner to charge a fee for the fishing right in the areas near the coast, as it was proposed, implied a regulating effect that, according to the author, corresponded to the property right of land. The right of the owner to regulate the entry prevented the excess of fishing effort and maximized the rent guaranteeing the optimal number of fishers.
- Warming also stated that free access could lead even to a negative marginal product implying the utilization of immature stocks. So, even in times of high unemployment –and that was the case in the 30's– it was better to keep away from fishing the superfluous fisherman.

We must note that this last article was a response to a specific situation of Danish fisheries. In fact, at the time, Danish fishers demanded that the "Right to Eel Weir" should be abolished. This right to eel weir was an exception from the freedom of access that was the general rule in Danish fisheries. According to the Danish Fisheries Act –from the end of the 19th century– no one could be excluded "from a properly visited and marked fishing ground". But there was an exception: traditional Danish Law granted shorefront owners the right to set eel traps in the sea adjacent to their land property and property owners were entitled to charge fishers for permission to set traps in some of this specified offshore areas.

In one of their annual Assemblies, the Danish Fishing Association proposed to abolish private eels trapping rights with unanimity. Warming article was a protest against this change in *governance*. Warming opposed the introduction of free access to replace rental fishing in the limited area. He argued that this would lead to the total dissipation of rent. He was in favor of maintaining the existing system. His argument was that it produced the optimal regulation result. Instead of abolishing this system, he also proposed to introduce a similar system in all Sea governance.

The debate faded away, in 1931, leaving the law unchanged. But in 1955, when the debate was revived, the economic arguments of Warming remained ignored and the Danish parliament abolished the "Right to Eel Weir" (Gislason, 1995) and the private shorefront owners were compensated for this loss of privilege.

Another important confrontation point in this debate is the following: Note that his clear opposition to maintain extra-workers in fishery, appealing to the economic efficiency in the sector, could not be well accepted at the time. In the last quarter of 1930, the Great Depression was at his maximum level in Denmark (Eggert, 2010). Still Warming argued strongly against using employment in fisheries as an alternative in recession days, because extra fishers would impose an extra external cost to the other fishermen, dissipating the potential rent. And added another problem: because of the typical inertia in this sector, where socio-professional mobility is difficult (Acheson, 1981), after entering, the superfluous fishers would not move, fast enough, for more productive sectors, when the recession went over.

4. What went wrong? Causes of academic and political failure

Why these important achievements had not the justified academic applause and practical impact? What went wrong? How can we explain that the paper of Gordon (1954) is always presented as a classical one –one of the seminal articles in the area of socio-economic studies in natural resources and the environment–and the study of Warming (1911) remains a "perfect unknown", having, at the best, a minimum footnote in some academic texts? The investigation of how the sociological conditions of Science development affects the conceptualisation, the methodological framework and the results of a specific scientific domain, seems to have here, a good example.

First, there were some difficulties of personal and of academic nature. Of course, the fact that his article on fisheries was published in a Danish journal, in the original language of the author, was a significant factor for its weak disclosure. Only in the 80's, an English translation of the seminal article of 1911, by an important fisheries economist, P. Andersen, and a study from

Hannesson and Anderson on the contribution of Warming, gave the relevance that his legacy deserved (Andersen, 1983; Hannesson & Anderson, 1981). In the 50's, during a round table, promoted by FAO, to discuss the advances in Fisheries Economics, one of Warming's former Icelandic students, O. Bjornsson, called the attention to the work of Warming and made an English presentation of his model. It was only in 2010 that the Journal *History of Political Economy* published an English version of his article from 1931, translated by H. Eggert.

Note that the personal animosity and suspicion in the academic circuit that was referred made difficult his task. Also, some singular idiosyncratic aspects, as the one cited of not including extensive bibliographical references, were not in conformity with the usual policy in academic context.

Second, we must note that his findings and recommendations were not in line with the mainstream: not in accordance with the "sign of the times" and not in line with the usual methodological, theoretical and practical development of fisheries sciences. By one side, a lot of his results were, indeed, interesting in practical terms for fisheries regulation. But, by the other, they derived from an economic analysis and, in the early 20th century, when they were proposed, that economic perspective had no impact on the decision-makers of fisheries management. In fact, only in the 60's and 70's the Economics of Fisheries went on being really considered. Until the Second World War the management of fisheries were only administrative and the focus (and the decisions) came exclusively from biology.

Even for economists, it seems that his results were always in the opposite side of the mainstream. He proposed a regulation approach where economists and fishers associations proposed more liberalisation. He proposed the creation or, at least, maintaining the existing property rights, when everyone defended the free access. The basic lines of his thought were that a free market economy did not automatically lead to optimality and that government regulations were needed. The suspicion on the "invisible hand" would be a recurrence in his work. When the economic environment of the 20's battled in the sense of deregulation, the proposals of Warming of state regulation and control could seem to be misadjusted. Of course, there were also important authors, like Pigou, that defended the necessity of more regulation to solve the problems of market failure in the presence of externalities, but the "air of the *temps*" called for more liberalization.

At the same time, he was against the use of fisheries as a sector to absorb the unemployment resulting from Depression. That is, his defence of economic efficiency and sustainability of the sector put him in the unpleasant role. Even in a situation where the usual defenders of free market proposed a governmental oriented policy, his answer was in the opposite side. It seems that he was always on the "wild side of the street".

From another point of view (the one that highlights the specific conditions of Science development), we must note that the results of his investigation are, in fact, very close with those of Gordon and Scott (in the 50's) that made the birth of modern Fisheries Socio-Economics.[4]But, as Topp (2008) pointed out, even if the theoretical fundaments and arguments are the same, the papers are very different with respect to scope and composition and perhaps that explains the different forms they were seen and used by the academic community. The Gordon article was directly focused on Fisheries Economics and resulted from a program of investigation that, at the time, tented to apply the economic theory to fisheries contemporary programs.[5] This article was published in a highly considered journal (*Journal of Political Economy*) and in a special period, when there was a group of researchers very interested in the results of public regulation in this area. By the contrary, Warming findings reflected his study about the flaw of competitive

[4]And note that were fundamental steps to the posterior discussion on important topics as the "Tragedy of the Commons", property rights and efficiency; institutions and development; natural resources, sustainable development and governance models.

[5] Note: In the late 50's and early 60's, FAO went on organizing interesting conferences where a debate about property rights and fisheries regulation took place. Although he was not a fisheries economist, the presence list includes a name that dispenses comments: Ronald Coase.

market but did not deal with contemporary and international debate on regulation (Coelho, 2011, 2012).

Another interesting issue relates with the special links he created and developed with marine biologists and policy makers. First, it should be stressed that his research contains important elements of fisheries management that had no explicit reference in Gordon's article. Perhaps for economists this debate did not seem very important at the time, but that should have been important for biologists and executives. For example, his discussion about the concept of MSY (Maximum Sustainable Yield) and the impossibility of getting the most efficient result with only the usual command and control conservation measures had to have impact in the biologist-commanded, traditional fisheries management.

Along the period of his research developments, the current situation in the sector of fisheries went on some important changes. By the end of the 19th century, the idea of inexhaustible fisheries was slowly being discussed. The leading fisheries biologist T. Huxley and other important biologists began to worry about the decline of fish stocks in the Baltic Sea and in the North Atlantic. This laid to the formation of the ICES (International Council for the Exploration of the Sea) in 1902. With headquarters precisely in Copenhagen, ICES pretended to be a forum of multidisciplinary discussion on practical fisheries problems. It was also in this context that Petersen, an important researcher in Marine themes, published a paper on the North Pacific fur seals and, consequently, one of the first cooperation treaties in the area of fisheries conservation was introduced.

But the focus was still on Biology. As we said, only in the 50's, the modern Socio-Economics of Fisheries –with the research of Gordon (1954) and Scott (1955), and the modern Fisheries Biology– with the studies of Schaefer (1957) and Beverton and Holt (1957), evolved. Jens Warming tried to communicate with marine biologists and to present his vision about the relevance of economics in the treatment of the conservation problem. He sent his papers to important researchers in this area (Kyle, Petersen and Hjort), even for the Danish prime minister –former fisheries minister–, but with few results.

This last reference put also in evidence his work with politicians and other social scientists. In fact, as we said, his participation in the political discussion, at several levels, was significant. His approach to the Danish Fisheries Association and to other important decision-makers –in the Government and in the Fisheries-Labour Organizations– was noticed. His social commitment was clear. Sadly, the results were not the expected. His intervention at the practical level had not visible effects and, at the theoretical level, his work was only distinctive. The focus on Biology still maintain for decades. The multidisciplinary approach proposed by the ICES was delayed. Even in the new millennium, the participation of economists and other social scientists –sociologists, political scientists and anthropologists– is still limited.

5. Final remark. Actuality and perspectives for the future

A final reference on the actuality of his thought: Warming's convictions and recommendations have, in the present, a real relevance. His preoccupation with superfluous workers in fisheries is now the subject of an important discussion on the Common Fisheries Policy (CFP). The CFP points to the necessity of making the balance between the social stability in the coastal areas, mostly dependent on fishing, and the objective of getting sustainable fisheries, implicating a reduction in the fishing effort to put it in line with the necessary renewal of the stocks. But these are contradictory objectives. To solve this equation is, perhaps, the major difficulty in the process of CFP reform. Now, with the economic crisis and the high levels of unemployment in the European economy, it seems more difficult to ask for a reduction of capacity.

Also, some problems, like "quota hopping", bring the idea that a system of quotas and TACs are not enough to get sustainable fisheries. That is, the command and control instruments, that made the core of the conservation and management regime of the CFP, can have results in terms of biological over-exploitation but, as Warming defended, cannot solve the economic problem. This problem rests, basically, in its common property nature. The solution of the externalities implies a socio-economic analysis and the introduction of Rights Based Management methods. The generalization of tools like Individual Transferable Quotas (ITQs) puts a lot of pressure in

the traditional discussion of efficiency vs. equity when privatizing use rights in fisheries (Coelho et al., 2011).

Also, at the international level the discussion about high sea fisheries Governance: property rights are in the core of fisheries management and the problem becomes more complex when fisheries are transboundary by nature. Extended fisheries jurisdiction gave the coastal states property-rights and the potential of a sustainable management of fisheries. However, the general evolution towards more exclusive rights didn't mean the exclusion of free access in international fisheries. The Law of the Sea (1982) doesn't exclude the principle of the "freedom of the seas" that remains in force in the High Sea.

One of the most penetrating subjects that emerged as a consequence of this new framework is the management of international fisheries commons. The so-called straddling stocks management was in the root-causes of serious "fish-wars" in the 90's. The conviction of the coastal states, that they would be entitled "de facto" property rights on the transboundary resources, was not correct. These virtual rights ended for showing emptiness. Actually, these resources remain as "international common property" and the usual "tragedy of the commons" is well reflected in the overexploitation of these resources. The vague, imprecise form as they are defined in the Convention of 82 is in the origin of the problem; so they can be called the "unfinished business" of the Law of the Sea. Is the solution an enlargement of the 200 miles Economic Exclusive Zones?

Finally, it should be noticed that, in a certain measure, Warming circumvented the traditional opposition between old Institutional Economics and Neoclassical Economics. He anticipated important issues of New Institutional Economics, such as "commons", public regulation, law & economics, models of governance, etc. His heterodoxy is clear, but the use of marginalism as a fundamental framework seems to be in advance and taking, not only fundamental topics of research, but also the methodological positioning of New Institutional Economics. He also "builds on, modifies, and extends neoclassical theory".

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